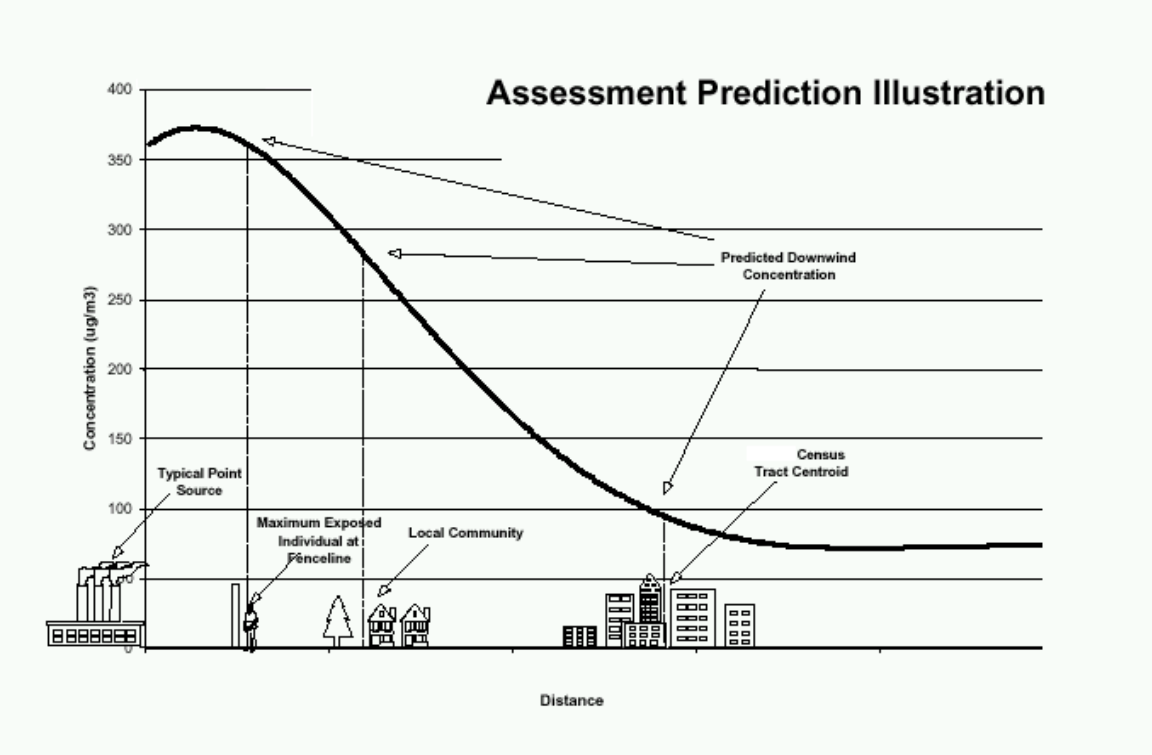
Attachment 6
The Impact of the Current NR 445 on Wisconsin's Hazardous Air Emissions

The purpose of Chapter NR 445, Wisconsin's Hazardous Air Pollutant regulation, is to protect public health and welfare from inhalation exposure to hazardous air pollutants that are emitted by stationary sources.

Unlike criteria pollutants (volatile organic compounds, nitrogen oxides and sulfur dioxide), the concern with most hazardous air emissions are primarily their immediate local impacts. Regional or even countywide emissions are not as great a concern as the impact at the local neighborhood level. Small sources are often located near residential neighborhoods, have short stack heights or even exhaust hazardous emissions horizontally out of a side wall, and therefore can provide far greater public exposure and health risk than greater emissions from tall stacks. While emissions from small sources may involve smaller quantities of pollutants, the impact to the local community can be very significant. The illustration below shows how emission concentrations change with the distance from the source.



Ch. NR 445 accomplishes its objectives by:

- identifying and listing specific hazardous air pollutants,
- setting ambient air concentration standards for the non-carcinogenic pollutants, and
- requiring state-of-the-art technology controls for significant emissions of carcinogens.

Simply identifying and listing hazardous air pollutants can have an impact on sources of emissions. Some firms have adopted, as part of their corporate culture, an objective of

being environmentally friendly. They may substitute or reformulate materials in order to avoid the use and environmental release of any material considered 'hazardous'. The decision not to use or to minimize use of materials considered 'hazardous' occurs either shortly after a new or updated listing of hazardous air pollutants in Ch. NR 445, or before starting a new process or before modifying an existing process. Similarly, some sources avoid use of hazardous materials because of the added cost and burden of recordkeeping for these materials. Emissions of hazardous pollutants listed under ch. NR 445 that are above certain threshold levels are required to be reported in the annual emissions inventory required under ch. NR 438. DNR does not know how many sources voluntarily chose to not use hazardous materials for either of these reasons, or how much hazardous emissions are prevented by these decisions, but anecdotally DNR understands these emission reductions occur and the amount could be significant to local air quality.

For the calendar year 2000 Air Emissions Inventory, 846 sources reported emitting 212 hazardous air pollutants. The most commonly emitted hazardous air pollutants were formaldehyde, toluene, xylene, benzene, methyl ethyl ketone, n-hexane, ammonia, and glycol ethers with over 100 sources reporting emissions of each pollutant. The greatest amount of emissions reported were of hydrogen chloride, methanol, xylene, sulfuric acid, toluene, hydrogen fluoride, methyl ethyl ketone, glycol ethers, styrene, stoddard solvent and ammonia with each pollutant having total reported emissions of over 1,000,000 pounds.

Sources that emit significant amounts of hazardous air pollutants typically comply with ch. NR 445 by one of the following methods.

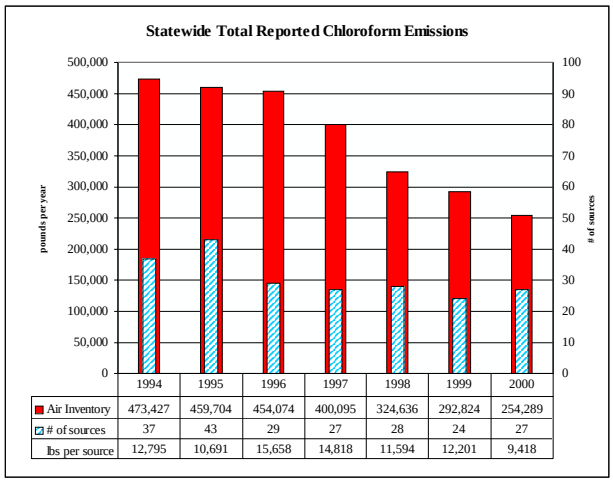
- Reformulate or substitute materials (e.g. use water-based coatings)
- Meet a fuel use exemption criteria (e.g. use only clean burning fuels)
- Change the process to reduce emissions (e.g. use chemical scavengers that prevent release of hazardous pollutants from the process)
- Raise the stack height to achieve greater dispersion
- Reduce emissions by use of emission control equipment

Sources that have the potential to emit significant amounts of hazardous air pollutants but that typically do not operate anywhere near their full potential often take operating restrictions (e.g. hours operated each day or process rates) to reduce their potential to emit hazardous air pollutants. These are not real emission reductions and are therefore <u>not</u> considered in this review of emission reductions achieved by ch. NR 445.

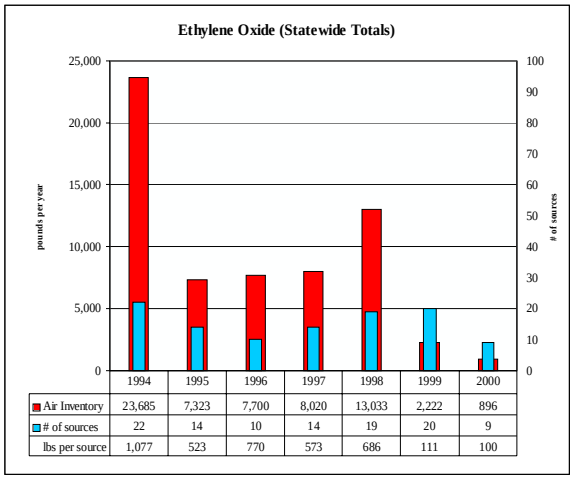
Ch. NR 445 has accomplished significant reductions in hazardous air pollutant emissions for specific types of sources and individual sources. Most notable is the reduction of all types of incinerators in Wisconsin, from small grocery store incinerators to municipal solid waste incinerators, resulting in reduced emissions of dioxins, metals, formaldehyde, and benzene, among other pollutants. The wide distribution of incinerators and their emissions affected a large portion of Wisconsin's population. Previously small incinerators were commonly used at supermarkets, apartment buildings, hospitals and commercial establishments. There were over 100 hospital incinerators and an undocumented number of incinerators at commercial establishments. Today, Wisconsin

has just a few sources incinerating solid waste (2 burn municipal waste, one burns hospital waste, several burn pathological waste) and no small commercial incinerators. In 1998, Illinois, in contrast, had 70 incinerators at supermarkets.

Ch. NR 445 also provided significant reductions in chloroform emissions from pulp mills and ethylene oxide emissions from hospital sterilizers. Both are listed in ch. NR 445 as probable carcinogens.



	1994	1995	1996	1997	1998	1999	2000
Air Inventory	473,427	459,704	454,074	400,095	324,636	292,824	254,289
# of sources	37	43	29	27	28	24	27
lbs per source	12,795	10,691	15,658	14,818	11,594	12,201	9,418



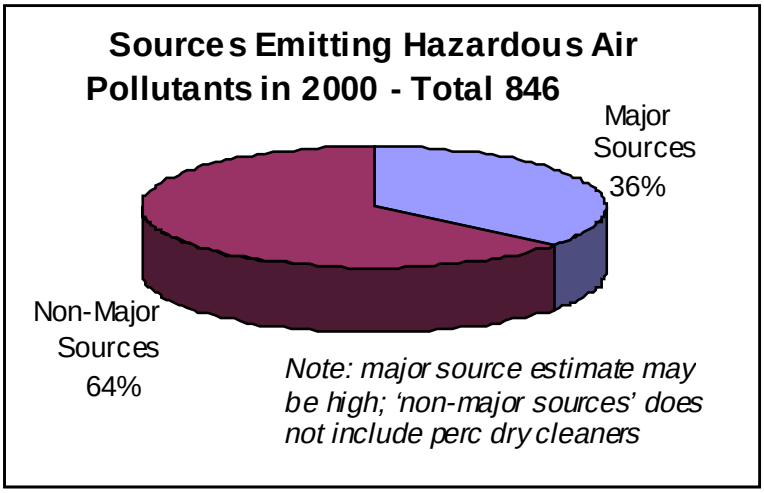
	1994	1995	1996	1997	1998	1999	2000
Air Inventory	23,685	7,323	7,700	8,020	13,033	2,222	896
# of sources	22	14	10	14	19	20	9
lbs per source	1,077	523	770	573	686	111	100

Emissions from wood burning sources have also been reduced. Excessive amounts of benzene and formaldehyde are emitted from incomplete combustion of waste wood, bark and other fuels. Many wood burning sources (such as wood product manufacturers, utilities and paper mills) have reduced their benzene and formaldehyde emissions by meeting an exemption under ch. NR 445 for sources that can demonstrate that they provide good combustion technology. This exemption has also reduced the amount of burning of painted and treated wood which would emit metals and other hazardous pollutants, because the exemption is only provided for combustion of clean wood.

The self-assessment of hazardous emissions that is required by ch. NR 445 has made sources more aware of their hazardous emissions. For example, foundries have become more aware of benzene emissions from the casting process. Many foundries have taken action to reduce these benzene emissions through better design of sand additives. In this case, and in many others, greater care in process design to reduce emissions has the added benefit of also reducing the use of costly raw materials, and thereby provides significant cost savings to the industry.

With the development of the National Emission Standards for Hazardous Air Pollutants (NESHAPs, also known as MACTs) starting in mid-1990, ch. NR 445 took on a different role. With national MACT regulations taking the lead role at major facilities, ch. NR 445 plays the lead role with the regulation of hazardous emissions from smaller sources. “Major sources” for the federal MACT program are defined as those with a potential to emit 10 tons per year of a single Clean Air Act hazardous air pollutant, or 25 tons per year of a combination of the 188 federal hazardous air pollutants. For the non-major

sources, the MACT regulations only apply to the few sources subject to an area source MACT, such as chromium electroplaters. As shown in the pie chart below, nearly two thirds of the sources reporting hazardous air emissions do not meet the "major source" definition. With the exception of the few area source MACT standards, only NR 445 applies to these smaller sources for the purposes of hazardous air emissions.



For major sources, NR 445 applies to emission units that are not subject to a MACT. In some cases, the MACT limitations are similar to the limits previously required under ch. NR 445. For emission units not addressed by the MACT, the ch. NR 445 requirements remain in effect. For example, at one facility the MACT basically provides the same requirements as previously required under ch. NR 445 for the production units. However the MACT does not address emissions of over 4000 pounds of benzene in the wastewater treatment system. For the wastewater system, the ch. NR 445 limitations remain in effect to reduce emissions.

Ch. NR 445 also applies to emission units that emit state-only hazardous air pollutants, such as ammonia and stoddard solvent (mineral spirits). Emissions of these two pollutants exceeded one million pounds each in the year 2000. These two hazardous air pollutants are regulated under NR 445 for their acute non-cancer health effects and, in the case of ammonia for its chronic non-cancer health effects.

In summary, hazardous air pollutants are a public health concern at the local level, the federal program affects about a third of the sources in Wisconsin that emit hazardous air pollutants, and ch. NR 445 has resulted in significant reductions in hazardous emissions through a combination of voluntary actions taken by sources to not use or to minimize their use of hazardous materials and of regulatory actions taken to meet the ch. NR 445 emission standards.